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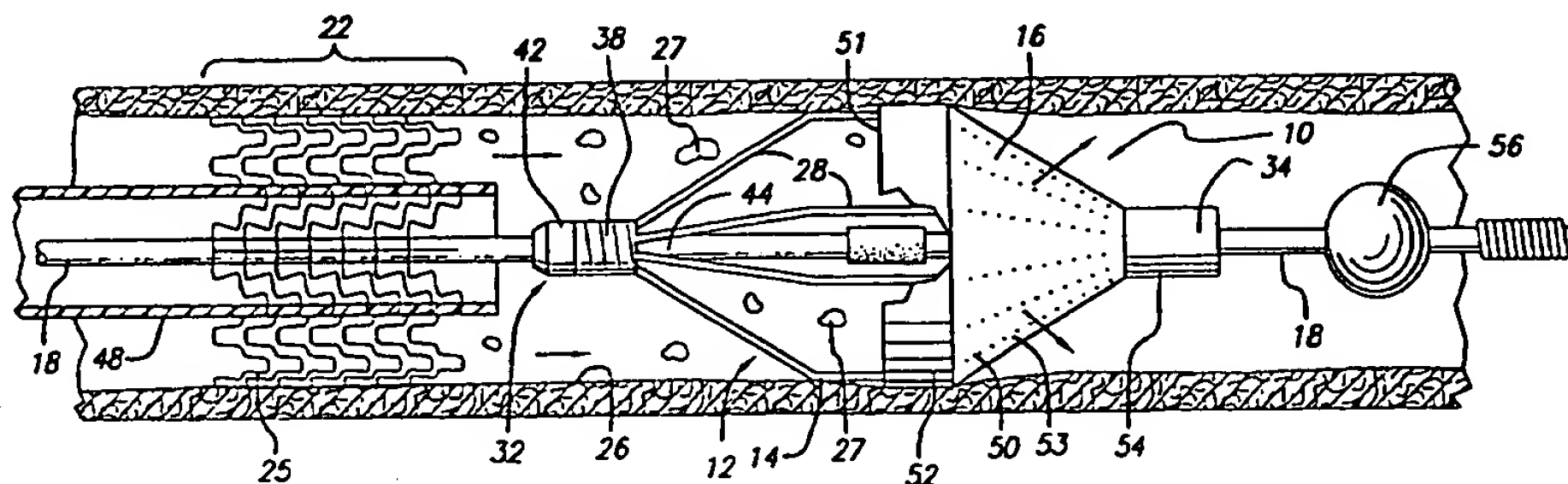
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: NITINOL ALLOY COMPOSITION FOR SHEATH DEPLOYABLE AND RE-SHEATHABLE VASCULAR DEVICES



(57) Abstract: An embolic protection device that employs a superelastic alloy self-expanding strut assembly with a small profile delivery system for use with interventional procedures is disclosed. The expandable strut assembly is covered with a filter element and both are compressed into a restraining sheath for delivery to a deployment site downstream and distal to the interventional procedure. Once at the desired site, the restraining sheath is retracted to deploy the embolic protection device, which captures flowing emboli generated during the interventional procedure. The expandable strut assembly is made from a superelastic alloy such as nickel-titanium or nitinol, and includes a ternary element in order to minimize the stress hysteresis of the superelastic material. The stress hysteresis is defined by the difference between the loading plateau stress and the unloading plateau stress of the superelastic material. The resulting delivery system including the restraining sheath has a small profile and has a thin wall.

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INTERNATIONAL SEARCH REPORT

International Application No.

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61F2/01

According to International Patent Classification (IPC) or to both national classification and IPC.

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61F C22F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 99 44542 A (SCIMED LIFE SYSTEMS, INC.) 10 September 1999 (1999-09-10) the whole document ---	1-7,9-23
Y	US 5 885 381 A (MITOSE ET AL) 23 March 1999 (1999-03-23) cited in the application the whole document ---	1-7,9-23
A	WO 98 20801 A (BETH ISRAEL DEACONESS MEDICAL CENTER) 22 May 1998 (1998-05-22) page 11, line 20 - line 22 page 13, line 22 - line 23 -----	1,10,17, 21

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Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9944542	A	10-09-1999	US 6152946 A DE 1059890 T1 EP 1059890 A2 WO 9944542 A2	28-11-2000 06-09-2001 20-12-2000 10-09-1999
US 5885381	A	23-03-1999	JP 9078165 A US 5951793 A	25-03-1997 14-09-1999
WO 9820801	A	22-05-1998	US 5653759 A WO 9820801 A1 AU 1052997 A	05-08-1997 22-05-1998 03-06-1998

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